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EFFECTS OF PERCEPTUAL TRAINING ON RACIAL PREFERENCES OF KINDERGARTEN CHILDREN

Jane Gibson

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EDUCATIONAL RESEARCH INSTITUTE OF BRITISH COLUMBIA
Suite 400 - 515 West 10th Avenue
Vancouver, B.C. V5Z 4A8

Telephone: 873-3801

Effects of Perceptual Training on Racial Preferences of Kindergarten Children

by

Jane Gibson

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Effects of Perceptual Training on Racial Preferences of Kindergarten Children

Early learning experiences are considered to be critical to the intellectual and social development of young children. One such area of development is the formation of attitudes towards others. By age five, young children are developing ethnic attitudes, prejudices and stereotyped thinking (Milner, 1975; Lambert and Kleinberg, 1967; Radke, Trager and Davis, 1949). A number of studies have documented the selection of white as the preferred skin colour among young children (Renninger and Williams, 1966; Clark and Clark, 1955; Goodman, 1955). It appears that a child's evaluation of skin colour with its related associations may begin early in life.

Hohn (1973) conducted a study intended to provide a basis for the construction of educational interventions that would influence the development of attitudes of young children. Two potential procedures were investigated. One approach used Piaget and Inhelder's research on perspective taking. This treatment was based on the hypothesis that training in logical thinking tasks designed to enhance one's perspective taking abilities would have a positive effect on racial attitudes. The other approach was developed from the investigation of the growth of role-taking and communications skills that had been conducted by Flavell, Botkin, Fry, Wright and Jarvis (1968). Here the treatment involved role-taking tasks that emphasized the development of empathy for others. Hohn's study involved 42 kindergarten pupils from an university experimental lab school and 21 kindergarten pupils from an elementary public school. The 42 lab school children were randomly assigned to two

treatment groups: a Piagetian task training group and a role taking group. The 21 public school children, identified as a no-training control group, were involved in traditional Social Studies exercises conducted by their regular classroom teacher. Hohn concluded that the training on both the Piagetian and role-taking tasks significantly reduced racial attitude scores when compared to the effects of no specific training. Attitude test scores for the subjects in the treatment groups showed a reduction in the tendency to select white as the preferred skin colour, that is, a reduction in their pro-white bias.

The purpose of this research was to replicate Hohn's (1973) study under tighter experimental conditions and with certain aspects of Hohn's procedures modified. The initial modification was to reduce the scope of Hohn's research to the investigation of one theoretical approach only. That one area would be the effect of the Piagetian task training on the reduction of pro-white bias. Other than removing one treatment group, this modification did not interfere with the basic structure of the original study. The selection of the Piagetian treatment only allowed for a focusing on specific perceptual activities designed to enhance the development of perspective and on the subsequent effect of the resulting cognitive growth on attitude formation. It is noted as well, that Hohn and Schwartz do recommend that some role taking activities be withheld from formal programmes until children have acquired certain "prerequisite perceptual skills and cognitive operations" (Hohn and Schwartz, 1971, p. 22).

Piaget and Inhelder's (1956) concepts of "egocentrism" and "projective space" provided the theoretical base for the study. The preoperational child, developmentally egocentric, operates from her own point of view and is generally unaware of the viewpoint or perspective of others. Hohn refers to this form of insensitivity to others as cognitive egocentrism. However, once distinctions can be made between one's own perspective and the perspective of others, the child becomes conscious of her own viewpoint as a particular one. This awareness indicates a lessening of cognitive egocentrism and the onset of the development of the concept of projective space. "Projective space,....., begins psychologically at the point when the object or pattern is no longer viewed in isolation, but begins to be considered in relation to a point of view." (Piaget and Inhelder, 1956, pp. 153-154) Lovell's (1966) work suggests that perceptual activity of a visual and tactile nature facilitates the acquisition of spatial perspective. Children must construct and transform spatial figures in order to develop a coherent system of spatial relationships.

In the context of attitude formation of young children, Hohn identified cognitive egocentrism with an unconscious preferential focusing on selected features and a lack of differentiation of viewpoints. He suggests that these characteristics, if not mediated through interaction with the environment, may result in the development of prejudicial attitudes and behaviours. "The young child who does not develop the skills of logical thinking and relate these to racial preferences in his early years may develop enduring prejudicial judgments." (Hohn, 1973, p. 435) It follows then, that teaching

strategies aimed at enhancing perspective development and improving logical thinking should facilitate attitude development that is based on fact and empirical data rather than on emotional prejudgment.

METHOD

Subjects:

The sample was selected from a pool of 55 kindergarten pupils from an elementary public school located in the lower mainland of British Columbia. Forty-two pupils whose parents or guardians had given written permission for their participation in this study, were selected as subjects. Sixteen of these children were in a morning kindergarten programme with the remaining 26 in the afternoon programme. While each of these pupils identified with a "home-room" teacher, all of them were part of a larger open-concept Kindergarten-Grade One area. In this team-teaching setting, each of the pupils would have interacted with each of the two female teachers during the course of each day.

Of the 42 subjects, 7 were of Chinese heritage, 5 of East Indian heritage with the remaining Caucasian children being primarily of Anglo or European background. The children ranged in age from 62 months to 76 months with the mean age being 69 months.

Both the 16 morning pupils and the 26 afternoon pupils were randomly assigned to two treatment groups. Twenty-one were placed in a Piagetian task group and 21 in a traditional Social Studies control group. The description of the second treatment group represents a modification of Hohn's study. Hohn's control group did not consist of randomly assigned members nor did the group receive treatment. Instead, his control group was a single kindergarten class that received traditional Social Studies

lessons from the regular classroom teacher during the experimental period. In order to avoid potential biasing of results through experimenter effect, the control group in this study was identified as a treatment group.

Treatment Procedures:

Each treatment group was randomly assigned to a smaller section consisting of a minimum of 4 and a maximum of 7 subjects. The 16 morning pupils formed two Piagetian-task groups and the two Social Studies groups. A similar grouping pattern was formed by the afternoon subjects.

Treatment was conducted over a six-week period with each group meeting twice a week for sessions of thirty minutes each. The length of the sessions was reduced from the 45 minutes indicated by Hohn in order to accommodate the classroom scheduling of the two kindergarten teachers. Also the thirty minute time slot was considered to be more appropriate for the age of the subjects. Each group met alternately with one of the two female experimenters so that any effect due to experimenter style would be minimized.

The Piagetian treatment involved group learning procedures in which the subjects were asked to manipulate materials and perform specified Piagetian operations. At each session either a new task was introduced or a previous one reviewed. The tasks ranged in difficulty from conservation of quantitiy, superordinate classification, reversibility, and multiple relations to two and three dimensional perspective training. These tasks were presented in a fixed sequence moving from simple to more complex. Complexity was described in terms

of typical ages at which children generally would demonstrate understanding of the concepts involved. For example, the concept of quantity is usually acquired from about age five to about age seven. The development of perspective taking abilities encompasses a broader range of time, from about five years of age to about ten years of age. In keeping with the group interaction procedures, helping behaviours were encouraged. Where possible, subjects assisted each other either through demonstration or explanation. The experimenters made certain that each task was resolved by the close of the session and that each subject left having experienced some success. Appendix A contains a complete description of the Piagetian training tasks.

The treatment group was also involved in group learning procedures. These subjects participated in Social Studies exercises developed from the expanding horizons model. Topics moved from those about self, family and school to learning about the immediate neighbourhood. While the approach relied primarily on teacher led discussion, the subjects were also involved in simple art activities, mapping experiences and introductory interviewing techniques. A description of the Social Studies tasks is provided in Appendix B.

Testing Procedures:

Although Hohn's study used a pre- and post-test design, this research was post-test only. As all the subjects were drawn from the same classroom environment, were randomly assigned to the two treatment groups and received training from the same two experimenters, it was assumed that any group difference in the test results would be due to treatment effect.

Attitudes were measured by an instrument developed by Hohn (1971).

This test uses a picture preference technique in combination with a semantic differential strategy. The technique was similar in format to the one used by Williams (1966). Hohn's pictures consisted of eight one-inch square, black and white photographs of individual people. These included a black man, a black woman, a black boy, a black girl and a corresponding set of white people. These pictures, mounted on blank cards, had been selected from magazines. For purposes of this study, some modifications were made in the preparation of the pictures to be used as stimulus items. Greater control was placed on the variables that may be found in photographs. The exposures of the people were a head and shoulders shot only. White people served as models for the photographs. All models had dark hair and eyes, none wore glasses and the adult male was clean-shaven. The models for the pictures of the children were in the same age range as the subjects in the study. One set of pictures became the stimulus set for the white man, white woman, white boy and white girl. A second stimulus set was prepared from the original exposures. However in this set, the skin colour was darkened to represent black skin. Through these modifications all of the picture variables except skin colour were controlled. The size of the photographs was also changed. Rather than use one-inch square pictures, the finished photographs were about six inches by five inches. The head and shoulder silhouettes were cut out and mounted in matched pairs on blank cards, making a total of four stimulus cards. The pictures were arranged so that on two cards the white-skinned image would be on the left side with the black-skinned image on the right. The reverse was true for the other two cards. A representation of the stimulus photographs is in Appendix C.

The four bipolar adjectives selected for the semantic differential were kind-mean, smart-stupid, good-bad and clean-dirty. These adjectives were considered to be common to the vocabulary of five and six year old children and to be highly loaded on the evaluative factor of the semantic differential.

The testing procedure involved a matched comparison. One pair of pictures, such as the black boy and the white boy, was presented to the individual subject. The experimenter told the subject a story about the pictures. Each story ended with the subject being required to choose which of the two boys was the one involved in the story. There was a story for each of the eight adjectives with versions of the story appropriate for each age level. A sample story is: "Two girls are in the same class at school. One of them is good in school. Which one is good?" After listening to the story the subject would indicate the girl considered to be the one who is good in school. Hohn's testing procedure was modified in two ways. One addition was that the subjects were asked to tell why they had chosen one photograph rather than the other. Their verbal responses were recorded by the tester. The other change involved the sequence of presentation of the stories. Rather than use Hohn's approach of random presentation, this study used a fixed format. It was believed that the adjectives "clean-dirty", because of their powerful connotation for middle-class children in particular, had the potential to contaminate subjects' choices should these adjectives appear at the beginning of the story sequence. In order to avoid this possibility, all subjects began with the story including the girls and the adjective "good". The succeeding stories alternated sex and age and formed a

sequence so that no more than two positive or two negative stories appeared in succession.

In the raw score data collection, a black skin choice was indicated by a 1 and a white skin choice by a 2. These symbols were translated into a score for each subject. The score value was based on the number of favourable or unfavourable adjectives that were associated with black or white. To get a high pro-white score the subject would have to associate the white models with positive adjectives, i.e. "is smart" and the black models with negative adjectives, i.e. "is stupid." For each story a pro-white response yielded a value of 2 and a pro-black response a value of 1.

Total scores on the test could range from 32 (all pro-black responses) to 64 (all pro-white responses). The stories and the directions for administering this attitude test are found in Appendix C.

Six tests assessing Piagetian concepts were administered to all subjects. These tests were chosen for their ability to measure the cognitive learning acquired during the training sessions. These were tests for conservation of number, conservation of distance, composition of classes, two-dimensional space, straight-line perspective and co-ordination of perspective. Appendix D provides a description of the six tasks and directions for their administration and scoring.

The tests were administered so that one individual conducted all of the attitude test and a different individual conducted all of the Piagetian task assessment. In this way a certain standardization of task approach and interpretation was assured. Both test administrators were white females and were experienced in working with children. Neither had been involved in any previous aspect of this research. The Piagetian

task assessor had extensive experience in the testing of young children. Subjects were randomly assigned to a testing sequence with both testers assuring that no one subject was tested twice in the same day. Each tester saw each subject twice so that the individual testing time did not exceed a maximum of fifteen minutes.

RESULTS

Between group differences in skin colour preference scores served as the dependent variable in the study. Scores on this test scale could range from 32 (all pro-black responses) to 64 (all pro-white skin responses). The lower the score the less the pro-white bias.

The attitude test data were analyzed using a BMDPV8 equal cell analysis of variance. One subject had moved out of the school during the study, one had incomplete data and two were not included in the final analysis as they were unable to participate in the treatment sessions in any meaningful way. This left 18 subjects in the Piagetian training group and 20 in the Social Studies group. To permit the equal cell analysis, four cells of equal size were required. These four cells of eight members each were identified in terms of treatment-control and male-female. A table of random numbers was used to reduce the total number to 32 subjects. In the analysis the fixed variables were, treatment and sex for the subjects and for the stories they were age (child, adult), gender (male, female), value (negative, positive) and basis of the story (the four bipolar adjectives). Table 1 presents the mean test scores for the attitude measure and Table 2 the results of the analysis of variance.

TABLE 1 - Mean Attitude Score for Subjects N = 32

Subject	Treatment	Piagetian Training	Social Studies Treatment
		1.94531	1.91211
	Sex	Female	Male
		1.90625	1.95117
Within Stories	Age	Child	Adult
		1.93945	1.91797
	Gender	Male	Female
		1.92773	1.92669
	Value	Negative	Positive
		1.92383	1.93359

	Good Bad	Kind Mean	Clean Dirty	Smart Stupid
Bipolar Adjectives	1.93750	1.93359	1.92969	1.91406

TABLE 2 - Analysis of Variance for Attitude N = 32

	Source	df	MS	F	p
Subject	Treatment	1;31	.28	.79	.38
	Sex	1;31	.52	1.45	.24
Within Stories	Age (child, adult)	1;31	.12	2.78	.11
	Sex (male, female)	1;31	.98	.02	.89
	Value (negative, positive)	1;31	.24	.27	.60
	Bipolar adjectives	3;29	.27	.37	.77

The analysis of variance for the Piagetian tests was based on scores from 38 subjects. The performance was rated from 1 (unable to perform any aspect of the task) to 4 (successful completion of the task). The interval scores of 2 and 3 recognized success in the intermediate succeeding steps found within each task. The highest possible individual score was 24. An analysis of variance found a significant difference between the two groups. The experimental subjects improved their ability to do Piagetian tasks. Table 3 presents the mean test scores on the Piagetian tasks and Table 4 the results of the analysis of variance.

TABLE 3 - Performance on Six Piagetian Tasks - Mean Scores N = 38

Task	Piagetian Training	Social Studies Treatment
Two-dimensional space	1.67	1.90
Conservation of number	3.00	2.55
Conservation of distance	2.44	2.25
Composition of classes	2.44	2.30
Straightline perspective	3.89	3.15
Coordination of perspective	2.28	1.65
Total on tasks	15.72	13.80

TABLE 4 - Analysis of Variance for Piagetian Tasks N = 38

Source	df	MS	F	p
Two-dimensional space	1	.49	.85	.36
Conservation of number	1	3.10	3.08	.09
Conservation of distance	1	.80	.72	.40
Composition of classes	1	.17	.28	.60
Straightline perspective	1	5.13	12.01	$< .01$
Coordination of perspective	1	3.19	5.21	.03
Total on tasks	1	41.25	4.42	$< .05$

Except for the first test item, the Piagetian training group obtained a higher mean score on each task. Table 4 indicates that experimental subjects performed significantly better than did the control subjects.

DISCUSSION

This study, like Hohn's earlier research, does indicate that kindergarten children do possess specific skin colour preferences and that these preferences can be measured. To the extent that skin colour can be associated with race, this skin colour choice may be considered a racial preference. Both studies found a strong pro-white bias. Both studies found that kindergarten children can be trained in Piagetian tasks. However, unlike Hohn, this study did not find that Piagetian training altered pro-white bias.

These findings raise the question of why the difference in the two studies. In the discussion of their 1971 study, Hohn and Schwartz, point out that change on the racial dimension was minimal for both experimental groups. They note that a non-significant increase in pro-white scores exhibited by the control group may have contributed to the significance of the main effect. Also their control did not receive any treatment. Experimental subjects who were pretested and then received a treatment atypical of their regular curriculum may have exhibited demand effect on the posttest. As well, the absence of control treatment may have resulted in experimenter effect. It may be also that the fifteen minute time difference for each of the training sessions meant that changes in the ability to do the Piagetian tasks were enough to reach statistical significance, but not sufficient to effect pro-white bias. In their investigation of the effects of conditioning strategies on racial attitudes,

Parish and Fleetwood (1975) found a relationship between the length of treatment time and change in attitude. As the number of training sessions increased, the attitudes of the subjects became increasingly more favourable.

Hohn sampled different populations in the formation of his treatment and control groups. Despite the absence of significant differences between the mean IQs of the two samples, it might be assumed that these two populations may have differed significantly on other dimensions. For example, the structure of the programme at the university experimental lab school may have reinforced the concepts presented in the Piagetian treatment while the public school programme may have employed very different techniques. Socio-economic characteristics of the two groups may have differed. The differing possibilities are many and as such may have implications for the validity of the study. In this investigation, both groups were samples from the same population, were from the same socio-economic background, and were members of the same classroom area.

It may be that modifications in the picture stimulus items may have contributed to the differences in findings. In this study the subjects had limited clues to use in making their picture choice. The only variable difference was skin colour. While some subjects verbally indicated recognition of the pictures as being the "same", this acknowledgement did not appear to render their choice more random.

While this study does not support Hohn's (1973) results, it does indicate the presence of a strong pro-white bias in kindergarten children in this school of British Columbia. The small number of subjects does not permit generalization from the results, however it is unlikely that

these findings would be restricted to this school. The pro-white bias remained constant across the racial groupings that were present in the treatment groups. A number of studies by Katz (1976, 1975, 1973) have found a relationship between the race of the examiner and responses on racial attitude measures. White examiners tended to ellicit more pro-white responses. The use of a white tester for all subjects may have contributed to the magnitude of the pro-white scores, but would not account for the general presence of a pro-white bias. While this study does not explore any causal relationships, the presence of a preference for white skin appears as a dominant feature that may influence the development of racial attitudes in these children.

Although Hohn's study did not include consideration of subjects' reasons for their choices, an examination of the recorded verbal responses may allow some insights into the nature and strength of the pro-white bias. A post hoc comparison was made between the experimental and control subjects' use of colour as a justification for a negative evaluation. The proportion can be found in Table 5. The chi square is 7.84. For df=1, a X^2=7.84 is significant at better than the 1% level.

TABLE 5 - Frequency of use of colour in verbal reasons for skin colour choice

	Colour	No Colour
Piagetian Training n=18	6	12
Social Studies Treatment n=20	16	4

The data provide fairly conclusive evidence that experimental subjects who improved in their ability to do Piagetian tasks were less likely to use colour as a justification for a negative evaluation. As their growth in ability is greatest in the perspective taking tasks, this would support a relationship between spatial perspective taking abilities and reasoning associated with attitude formation. It may be that the Piagetian training facilitated sensitivity to the more socially desirable response. While the experimental group's picture choice may be based on discrimination by colour, their verbal expression in the presence of an adult white tester might reflect an awareness of the more socially acceptable response.

Another possible explanation for the discrepancy between the pro-white picture choice and the verbal expression may be related to the design of the attitude measure. Subjects of kindergarten age may be responding to familiarity cues rather than racial cues. If so, they might be more likely to assign positive evaluation to stimulus items perceived as most like themselves rather than those viewed as less familiar. In a forced choice situation, the assigning of a positive evaluation to a less familiar (in this case the black skinned person) would require a corresponding negative evaluation of the more familiar (white skinned). As Parish and Fleetwood (1975) point out, this would mean that the pro-black attitudes would have to outweigh the pro-white attitudes that existed prior to the treatment. A testing context that did not demand the selection of one skin colour at the expense of the other might elicit different scores. The negative attributions to black skin may be further confounded by children's tendency to associate

"black" with "dirty". Black, then, is clearly undesirable (Williams, 1966). It may be that in this study, the verbal expressions come closer to identifying the kindergarten child's perception of skin colour as a racial cue. Should this be so, the experimental subjects would have significantly more positive attitude scores. However at the moment there is no evidence for this position. Data on the relationship between the expressed racial attitude and overt behaviour is needed. However, reduction in the use of colour as justification by the treatment group does suggest that training in Piagetian tasks may influence attitude growth of young children.

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APPENDIX A

Description of Procedures and Materials Used for Piagetian Training Tasks

Treatment - Description of Procedures and Materials Used for Piagetian Training Tasks

1.1

First Week:

Task A - Conservation of Quantity

Materials: - Balls of plasticine - same size - same colour

Procedures: 1. E. shows children two balls of plasticine and asks: "What do I have in this hand? this hand? Yes, this is a ball of plasticine and this is a ball of plasticine." E. says: "There is the same amount of plasticine in each ball. They are both the same. Do they look the same to you? E. asks each child individually - "Why do you think that?" (If response is no - they do not look alike - ask once more and on to next child.) After final agreement that they are the same, E. takes one ball and rolls it into a "hot-dog" shape - "I am going to take one ball and roll it into a "hot-dog" shape. Now, do I still have just as much plasticine in this ball as I have in this "hot-dog" ... or do I have more plasticine, less plasticine, or the same amount of plasticine in this "hot dog" as I have in this ball? Ask each child individually, "What do you think? Why do you think that____?"

Let's show that they both contain the same amount of plasticine. E. rolls "hot-dog" back into ball shape. Re-establish agreement on sameness.

2. Repeat demonstration.

3. Place children in groups of 2 to 3 depending on total group size. Give each group previously prepared set of 2 equal-sized plasticine balls (all the same colour). Direct pupils through demonstration with E. giving the phrases and questions and the pupils manipulating the materials and answering the questions.

4. E. repeats demonstration.

First Week:
Task B - Classification - Looking for Similar Attributes

Materials: Two pictures of sparrows, two pictures of ducks on 8½ x 11 paper.

Procedure: 1. Two pictures of sparrows.
E. holds up picture of birds. "What do I have? Yes, I have two pictures of some birds. This bird is called a sparrow. Here is a picture of a sparrow and here is a picture of a sparrow. How are these two pictures the same?"
Yes - they both show birds.
- they both show sparrows.

2. Two pictures of ducks.
Repeat the same procedure using two pictures of ducks. "Do you think that ducks are birds?" Have pupils verbalize that they both show birds.

3. A picture of a sparrow and a duck. E holds up pictures. "What do I have? Are these two pictures the same in any way? What do you think? In what way is a duck the same as a sparrow? Yes, they both are birds, they both have feathers, ... wings, ... 2 legs ... A duck is the same as a sparrow in many ways."

E. mentions dogs and includes them in conversation. "Are dogs the same as ducks? No. Are they the same as sparrows? No. Which are the ducks most like ... the sparrow or a dog? Why do you say that?"

A d u c k i s a _____.

_____

A s p a r r o w is a _____.

_____

1.2

First Week:

Task C - Logic of Relations - Reversibility - Brothers and Sisters

Materials: - A number of cut-out paper dolls to represent girls and boys.

Procedures: 1. E. asks how many children have brothers or sisters. Establish that almost everyone has sister(s) and/or brother(s).

2. E. directs next activity using one of the Ss brother/sister situation as an example. E. asks - "How many sisters have you? And how many brothers?" [Let us assume that Ss is a girl and has a sister A and a brother B.] Print name of Ss, Sister A and Brother B on the appropriate cut-out.

Establish with group - This is Ss_____, this her sister _____, and this is her brother _____. E. asks questions of whole group. How many sisters has A_____? Show me. How many brothers has A_____? Show me. How many sisters has B_____? Show me. And how many brothers has B_____? Show me.

3. E. asks (still using same example). How many brothers are in the family? Show me. How many sisters? Show me. How many brothers and sisters altogether? Show me.

4. Repeat demonstration using another Ss's family as an example.

5. E. says - "There are three brothers in a family - Paul, Dennis, Bob." As E. names brothers, E. places named cut-out dolls so that Ss can see them.

Have one Ss put a finger on "Paul." E. asks - "How many brothers has Paul? Show me." Repeat for "Dennis" and "Bob." "How many brothers are there altogether? Show me."

First Week - continued

6. E says - "Let's pretend that there are 3 sisters - Lisa, Judy, Patty. Close your eyes and pretend that you can see the three sisters - L, J and P. How many sisters has Lisa? Judy? Patty?

7. Have each Ss take enough cut-outs to show themselves with their brothers and sisters. E. puts name on Ss on appropriate cut-out. E. asks individual Ss - "Are you a brother/sister? How do you know? Show me." Encourage children within group to help each other with explanations. E. asks individuals - "You say that you are a brother/sister. What is a brother/sister?" With aid of cut-outs and questions - ("What do you have to have in order to be a brother/sister?" Establish that in order to be a sister/brother one must have a brother or a sister.

8. E. says - "John has 3 brothers: Joe, Tom and Sam." Have cut-outs labelled to show 4 boys. "How many brothers has Joe? Tom? Sam?" In each case have Ss support their answer with evidence. (Show me.) "How many brothers are there in this family? Show me."

9. Repeat without aid of cut-outs.

2.1

Second Week - Day One

1. Review: Task A - Conservation of Quantity

   Task B - Classification - Looking for Similar Attributes

   Task C - Logic of Relations - Brothers and Sisters

2. Task D - Horizontal Axis

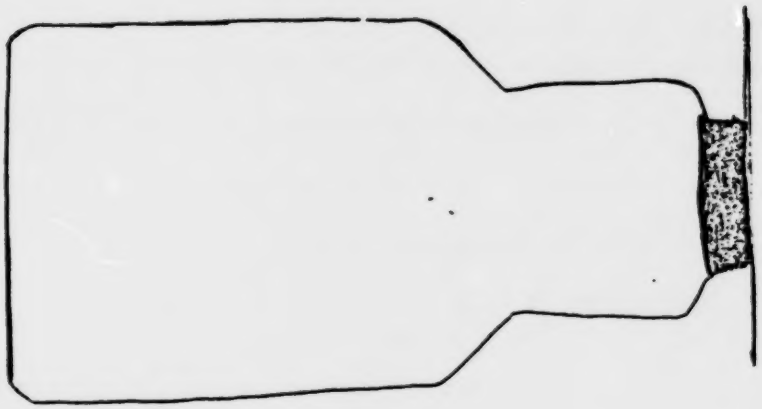
   Materials: - 2 same sized bottles - filled 1/4 and 3/4 with coloured liquid.
   1 different shaped bottle - filled with coloured liquid.
   answer sheet (attached), crayons

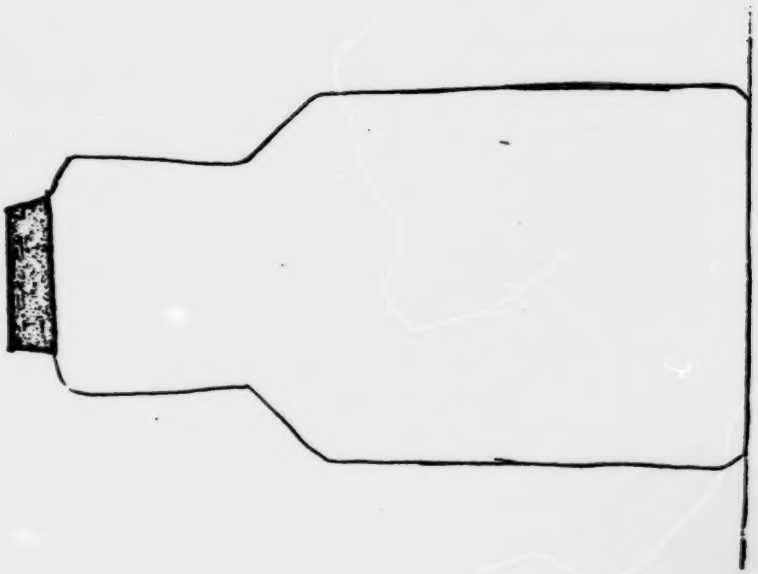
   Procedures:

   1. Begin with first of 2 same-shaped bottles 3/4 filled. E. asks Ss to describe the bottle. "What do you think is in the bottle? How full is the bottle?" Establish that the bottle is mostly full. "How can we tell?" Turn to first part of answer of sheet. E. says, "This drawing of a bottle represents our mostly full bottle. How can we show this on our paper?" Help children acquire experience of drawing a straight line to represent the water level on the blank bottle. Direct attention back to the 3/4 filled bottle. E. asks, "What would happen to the water level if we turned the bottle upside down? What do you think?" Ss are asked to draw the water level on the upside down blank bottle on the answer sheet. After each Ss is finished, E. asks a Ss to carefully turn the bottle upside down. Ss compares their drawings to the actual drawing. Each Ss is asked to explain her water level decision. Where necessary, changes are made to show the water level accurately.

   2. Repeat above demonstration using second of the two similarily shaped bottles with 1/4 fill. Have a second answer sheet for the Ss.

   3. Use the different shaped bottle filled 1/2 with coloured liquid. Again have Ss manipulate bottle and show answers by drawing water level on blank bottles on a separate answer sheet. E. asks "Ss - How did you know what the tipped bottle would look like? Why do we show the water level as a straight line when the bottle is on the table?" Discuss for both upright and tipped upside down bottle. E. asks, "Would this happen if the bottle were on the floor? What do you think? Show me." Ss are quizzed to ascertain whether or not they have acquired the horizontal axis concept (water level line should be related to an external level, such as the table or the floor.)





2.2

Second Week - Day Two

1. Review: Task A - Conservation of Quantity

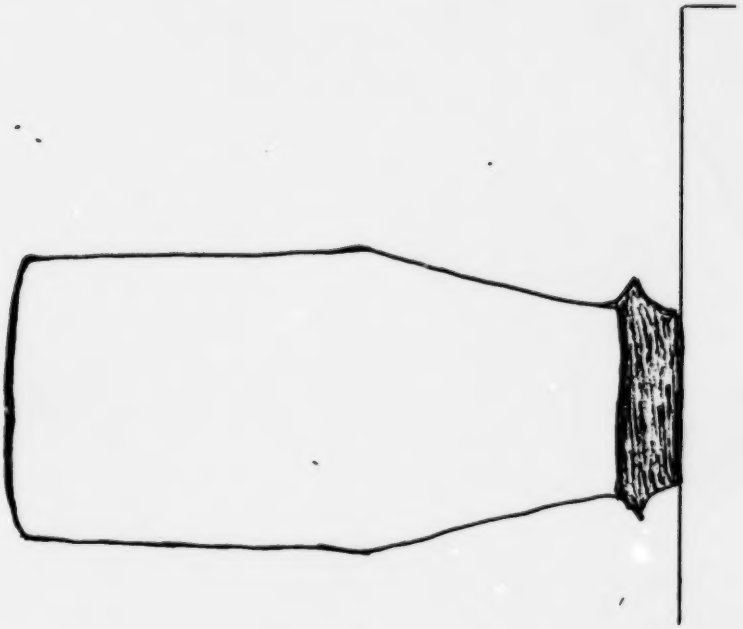
   Task B - Classification - Looking for Similar Attributes

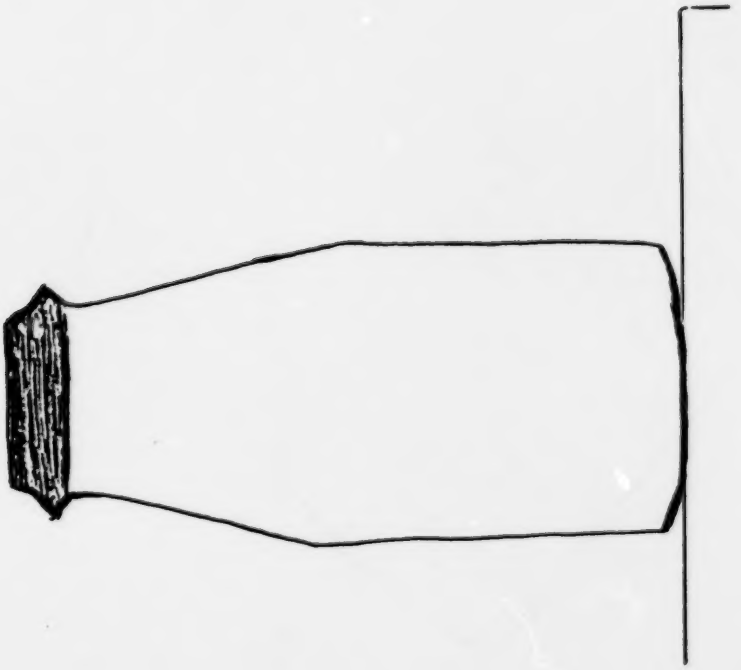
   Task C - Logic of Relations - Brothers and Sisters

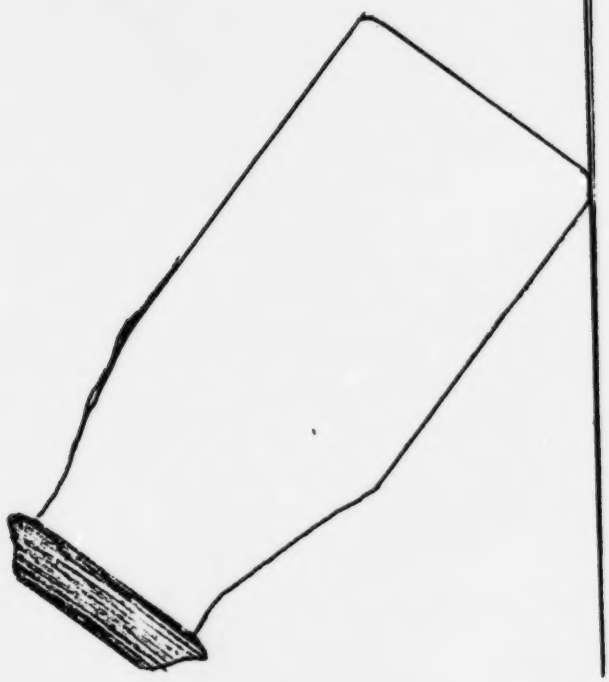
2. Redo - Task D - Horizontal Axes

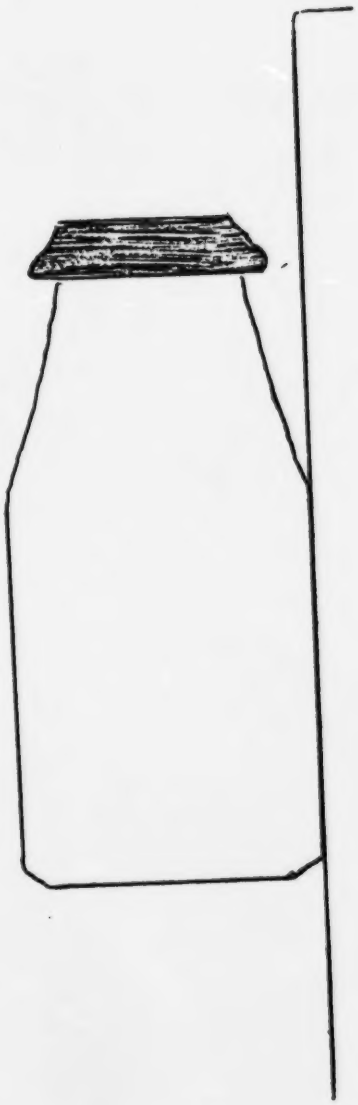
   Procedures #1
   #3

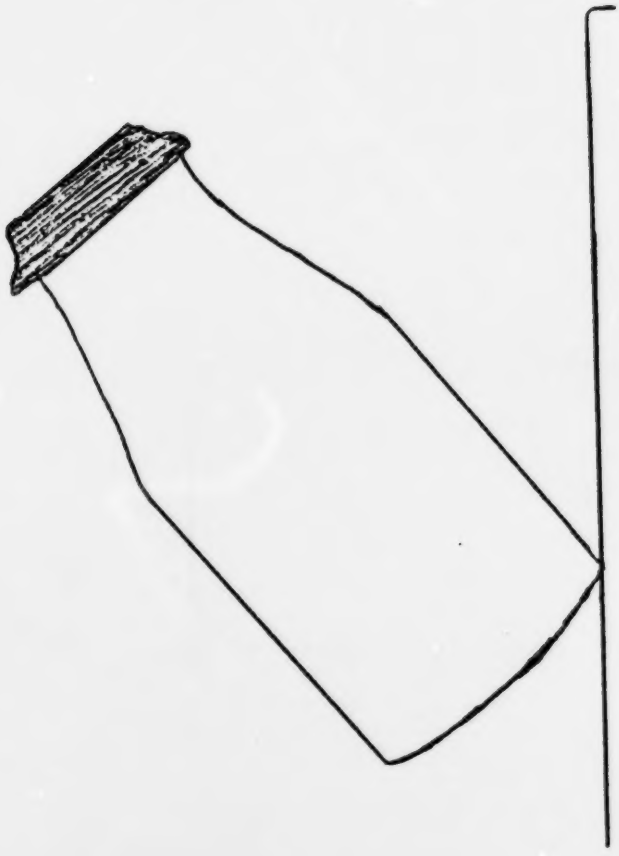
   4. Direct attention the 1/2 filled bottle. E. asks, "What would happen to the water level if we tipped the bottle to one side? What do you think? Show me." Ss are asked to draw the water level on first tipped blank bottle on the answer sheet. After each Ss is finished, E. asks a Ss to tip the bottle. Compare answers. Relate water level to table top (represented by line on answer sheet). Repeat for bottle tipped in other direction and bottle lying on its side.











3.1
Third Week - Day One

Task E - Geometric Sections

Materials: - Plasticine cylinders, balls, pyramids (prism)
- Knife
- Drawing paper, pencils

Procedure: 1. E. shows Ss plasticine roller cylinder. Have all Ss view cylinder lengthwise. Discuss its shape (like a long box-rectangular). Have Ss draw shape on answer paper. (▭).
Repeat for end view.
What does the cylinder look like when you look like when you look at one end? Show me.

2. E. says, "I'm going to cut this roller in the middle" (transverse). E. takes knife and holds knife over the plasticine without actually cutting into it, but indicating clearly the place and direction of the intended cut. E. asks, "What shape will the side be where it's been cut? What do you think? Why do you think that? Show me." Have Ss draw predicted shape on answer sheet. E. says, "Let's check our answer." E. takes knife and makes transverse cut on roller at spot previously indicated. Discuss answers why shape is circular. E. asks, "What shape would the cut side have if I made another cut through the middle of the roller? What do you think? Why do you think that?" E. makes another transverse section and the answers are discussed.

3. Repeat procedure with logitudinal section of the roller. E. shows where the lengthwise cut will be made. Ss are asked to draw the predicted shape. A cut is made and the answers are discussed.

4. Repeat both transverse and longitudinal section with a plasticine pyramid shape. Have Ss draw shape of pyramid as viewed from bottom end △ and as viewed from side first. Designate the side to be drawn by putting a peg on the side.

3.2
Third Week - Day Two

Task F - Perspective Training

Materials:
- 2 Q-tips - each with end dipped in red nail polish
- Rectangular block made of plasticine
- Doll
- Drawing paper

Procedure:

1. E. places the objects, one at a time in the middle of the table. The doll is placed at 90° angle to the object. The Ss are first asked to draw the object as it appears to them, and then are asked to imagine that they are the doll and to draw the object as it would look to the doll. The children are seated in such a way that they cannot see the objects as the doll would.

2. First the two Q-tips are placed end to end. The doll should see the Q-tips end on end (•). The children should see the Q tips —•— or close to this position. Discuss position of the Q-tips. Ss are asked to draw the Q-tips in the position they see them. Discuss. Then E. asks Ss to imagine that they are the doll. E. says, "Now draw what the doll sees." Discuss shape and position as seen by the doll. Ss may go and stand behind the doll to verify the position of the Q-tips. Discuss the difference in the positions as seen from two different viewpoints. Why are they different? What do you think? Develop the understanding that where you sit makes a difference as to how you see things.

3. The second object used is the plasticine block which is placed lengthwise to the doll, but crosswise to the Ss. Ss are asked to draw the block as they see it. Discuss shape. Then E. asks Ss to imagine that they are the doll. Ss are asked to draw the block as the doll sees it. Discuss the difference in the shapes. Why are they different? What do you think? Reinforce the understanding that where you sit makes a difference as to how you see things.

4. In both sets of drawings, E. checks each child's drawing and allows those who are inaccurate to sit behind the doll and draw objects from that position. As much as is possible, have children assist one another in developing an understanding of having a different viewpoint depending on one's geographical location.

4.1

Fourth Week - Day One

I. Review of Horizontal Axes Task.

1. Provide Ss with booklet containing answer sheets. Place one bottle 1/2 filled with red liquid in centre of table right-side up. E. asks Ss to indicate the water level by pointing to bottle. Re-establish understanding of straight line of water level in relationship to table top.

2. Using red crayon, have Ss indicate in their answer booklets the expected water level for each of the following situations:
   a) bottle is upright
   b) bottle is upside down
   c) bottle is tipped to right at 45° angle
   d) bottle is tipped to left at 45° angle
   e) bottle is placed on its side

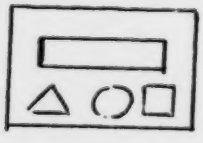
3. E. asks one Ss to demonstrate each position. After bottle is placed in appropriate position, check drawn responses from Ss. E. asks those who are relatively accurate in their drawings to explain how they knew what the tipped bottle would look like. Reinforce understanding of relating water level to an external level; i.e., table top.

II. Review of Task E - Geometric Sections.

Materials:
- Plasticine cylinder
- Plasticine pyramid
- Hollow ball
- Knife
- Answer booklet, crayons

Procedures:
1. With the exception of the hollow ball, the materials were used in the initial presentation of geometric sections.

2. E. again asks Ss what they think the side will look like after it has been cut. The answer booklet contains a response box with four shapes. Each prediction has a response box. The response boxes are identical.

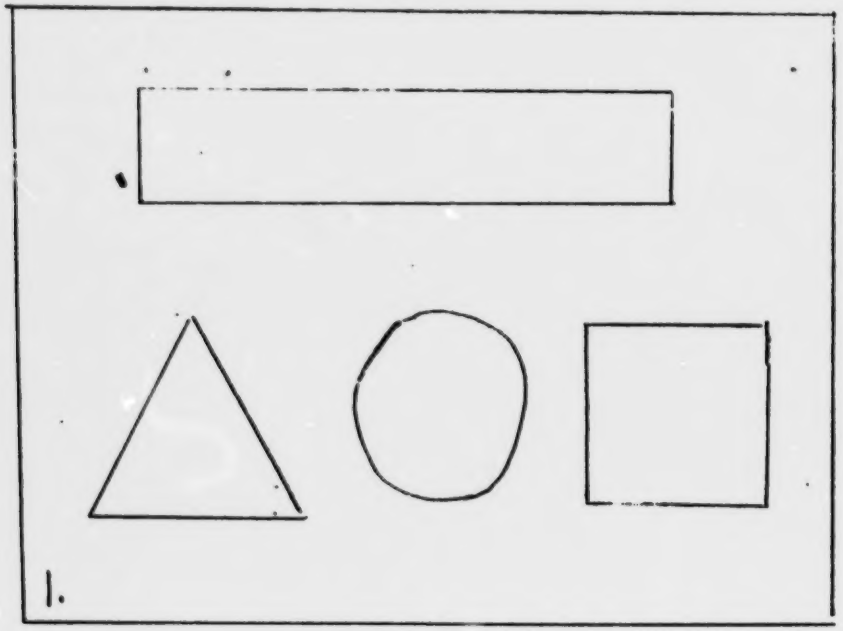


Fourth Week - Day One (continued)

Procedures: 3. E. asks Ss to colour in the shape they think the side will look like after it has been cut. All predictions are done at once in the following sequence.

a) cylinder - transverse
b) cylinder - longitudinal
c) pyramid - transverse
d) pyramid - longitudinal
e) hollow ball - transverse

4. E. then cuts the objects according to the outlined sequence. After each cutting, the section and the Ss' responses are compared. Ss are assisted in corrections where necessary. For each response, E. asks Ss why they selected a particular shape. "Why did you think that?"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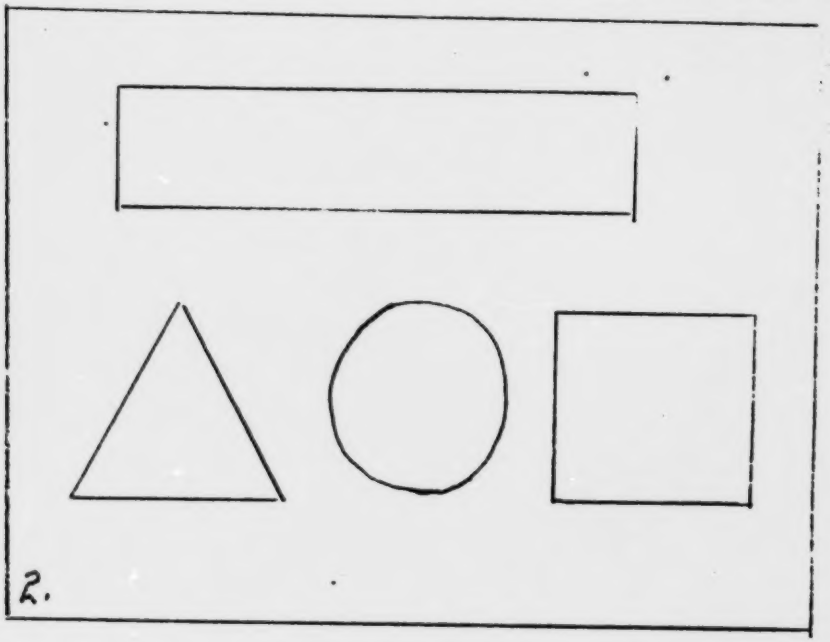
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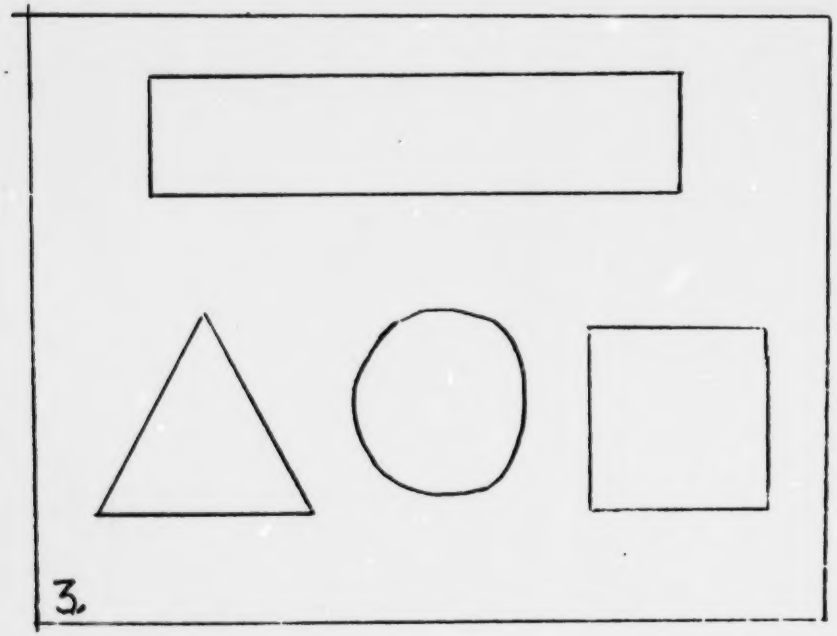
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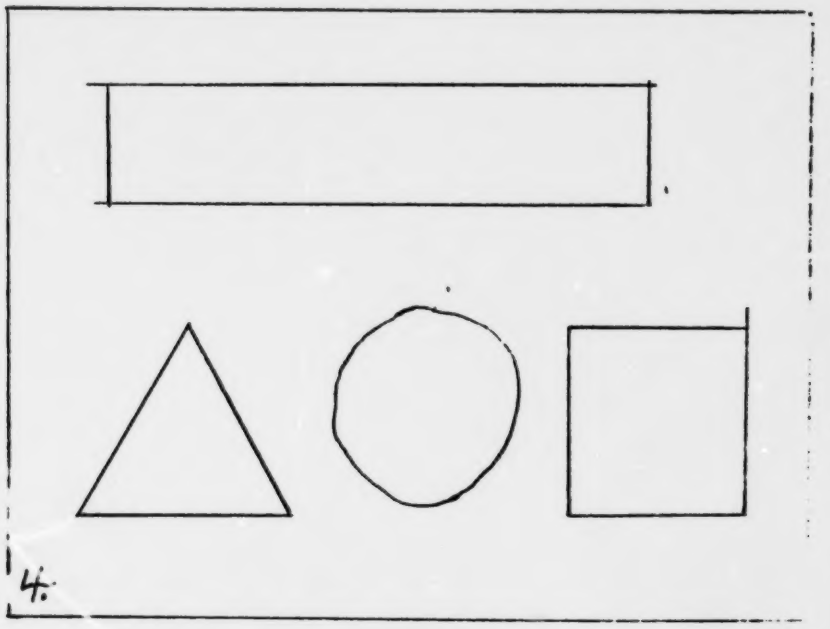
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4.2
Fourth Week - Day Two

Task G - Plasticine Ball Manipulation

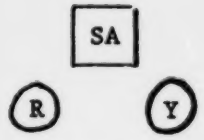
Materials: - 18 plasticine balls - 6 red, 6 blue, 6 yellow
- 6 flat pieces of stiff paper

Procedures:

1. The Ss are seated so that one SA is one side of the table and the remaining Ss are facing SA.

2. Each S is given 3 balls of plasticine of the different colours and a piece of flat paper to provide a designated surface for arranging the plasticine balls. The starting position for the plasticine balls is across the top of the paper in the following order from left to right - red, yellow, blue.

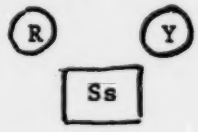
3. Ss are instructed to place the balls in the starting position. E. then takes the plasticine of SA and arranges them according to the following model.



The blue is placed out of the way to the left hand side.

S is asked to describe the model as seen by SA ; e.g., "The yellow ball is front of me - on my left side. The red ball is in front of me on my right side." The other Ss listen.

4. E. asks Ss to make the model as they see it. Ss are asked to describe what they see; i.e.,



"The red ball is on my left. The yellow ball is on my right."

Fourth Week - Day Two (continued

Procedures: 5. E. then asks the Ss to make the model arrangement as SA sees. Each S is to verify the model with SA. Ex. "SA_____, is this what you see? The yellow ball is on the left -- the red ball is on the right." SA responds, "Yes, that is what I see...."

6. After each model presentation - change student SA - one of the other Ss becomes SA. Repeat procedures from 3, 4 and 5 using the following model arrangements in the sequence presented.

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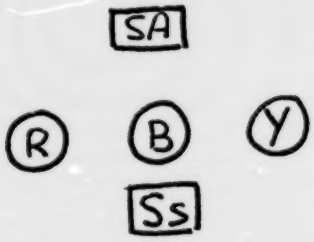

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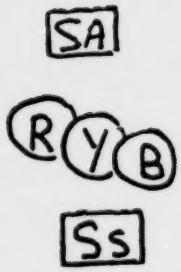

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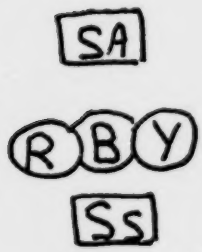


7. After each presentation, discuss the individual responses, and why they are right or wrong.

5.1
Fifth Week - Day One

Review of Task F - Perspective Training

Materials: 2 feather dusters - with brightly coloured plumes and long handles.
1 paper model of rectangular house having a brightly coloured front door on the narrow square end view and two brightly coloured windows on each side.
Response sheets.

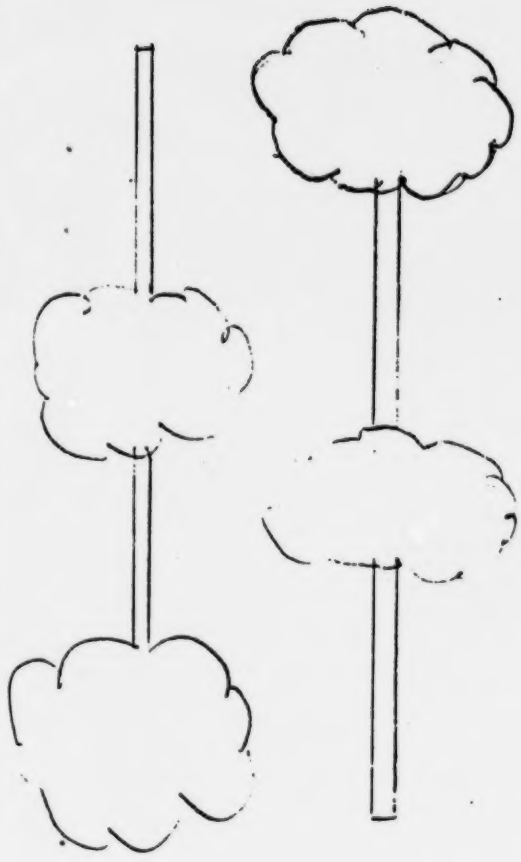
Procedure:

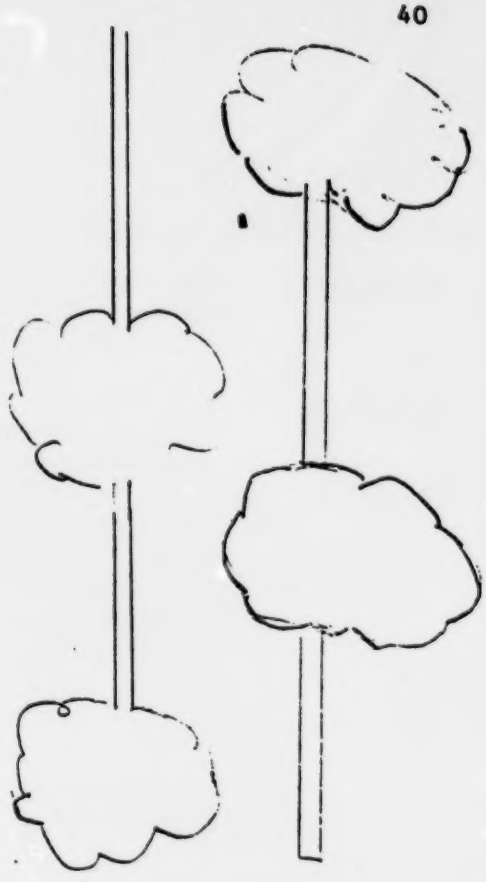
1. Ss are seated so that one SA is at the end of the table at a 90° angle to the objects. The other Ss sit along the side and 180° to the objects. E. will place the objects as required in the middle of the table. The Ss are first asked to indicate the object as it appears to them and then as it would look to SA. The Ss are seated in such a way that they cannot see the objects as SA would. If time permits, change the SA so that all Ss have the opportunity to sit at the 90° angle to the objects.

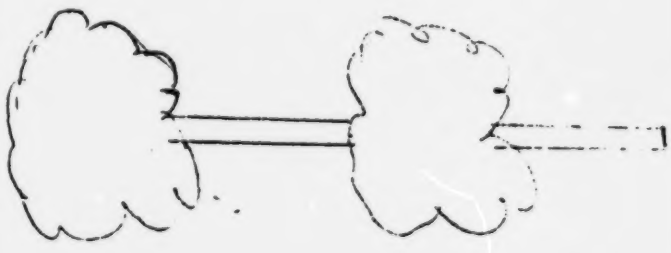
2. First, the "house" is placed in the centre of the table so that SA sees the door and the other Ss see the windows. E. tells little story about house as belonging to the teacher - M__ _____. Manipulate house, so that all Ss have an opportunity to see sides and front. Establish visible characteristics of sides and front. On response sheets, Ss are asked first to mark what they see, and then to mark what SA sees. Discuss responses. Why are the responses different? What do you think? Develop understanding that where you sit makes a difference to how you see things.

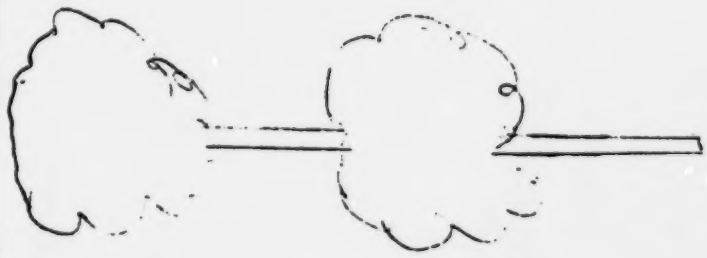
3. The second task involves the two feather dusters. They are placed on the centre of the table so that the plumes face SA. Ss are first asked to mark, on their sheets, the position of the dusters as they see them. Then Ss are asked to indicate the dusters as SA would see them. Discuss the difference in appearance. Why are they different? Reinforce the understanding that where you sit makes a difference to how you see things.

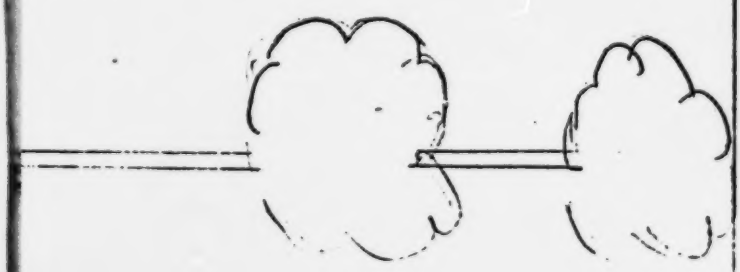
4. For both tasks, E. checks each Ss response and allows those who are having difficulty to become SA and describe the object from that position. As much as possible have children assist one another in developing an understanding of having a different viewpoint, depending on one's location.











5.2

Fifth Week - Day Two

Review of Task G - Plasticine Ball Manipulation

Materials: Plasticine balls - 3 red, 3 blue, 3 yellow
3 cylinders (insider of roll of toilet paper)
Answer sheets

Procedure:

1. The Ss are seated so that one SA is on side of the table and the remaining Ss are facing SA.

2. The SA is given the 3 plasticine balls - 1 red, 1 blue, 1 yellow. Each ball is placed on top of the cylinder - each to represent for discussion purposes, an ice-cream cone.

3. E. then takes the "cones" of SA and arranges them according to the following model

SA is asked to describe the model as seen by SA, ex., The yellow (lemon) cone is on my left. The red (strawberry) is on my right. The other Ss are asked to use their answer sheet to indicate the model as SA sees it.

4. After each model presentation change student S_A. Repeat procedures from 2, 3, and 4 using the following model arrangements in the sequence presented.

5. After each presentation discuss the individual responses and whether they are correct. Reinforce understanding, that where you sit makes a difference as to how you see things.

c.1

Sixth Week - Day One

Review of Piagetian Tasks

(1) Task A - Conservation of Matter

1. Give every Ss 2 balls of plasticine of the same colour. Follow the original procedure as outlined only having each Ss manipulate the materials. E. emphasizes: "Is there more, less than or the same amount of play dough in the ball or in the "hot dog? Why?"

(2) Task B - Looking for Similar Attributes

1. Use stickers of birds. Give every Ss the same sticker; i.e., one of a blue-jay or a robin. Indicate the sticker of another bird, example chickadee. Are these (the birds) the same in any way? Yes, they both are birds, they both have ..... Emphasize similar features.

(3) Task C - Reversibility

1. E. indicates one of the Ss (Name) says that (s)he is a (sister) brother? If that is so, what do we know about _____'s family? Repeat with one or two additional subjects to review understanding that one can both have a (brother) sister and be a (brother) sister.

(4) Horizontal Axis - Task D

1. Have sufficient bottles partly filled with a red liquid so that each Ss has one to manipulate. Review location of water level. Relate water level (straight line) to an external level; i.e., table. E. asks the Ss to examine and describe the water level after each successive manipulation

   (1) bottle upside down
   (2) bottle tipped to right
   (3) bottle tipped to left
   (4) bottle on its side

   Reinforce understanding of water level as related to an external level.

6.2

Sixth Week - Day Two

I. Review of Geometric Sections - Task E

1. Briefly discuss the shape of the side seen when a plasticine cylinder is cut
   a) transverse section
   b) longitudinal section
   Should some Ss have difficulty, E. cuts cylinder in sequence outlined. Repeat with plasticine rectangular block.

II. Review of Perspective Training - Task F

1. Briefly discuss view of house (cardboard model) when seen from side and when seen from front. Reinforce understanding that where you sit makes a difference as to how you see things.

III. Review of Three Dimensions - Task G

(Use blocks instead of plasticine balls.)

Materials:

3 blocks of different colours
Models of 3 blocks - Each Ss to have a set of 3.

Procedure:

Ss are tested in a group. E. arranges blocks in a variety of positions and asks Ss to arrange the blocks according to the way that E. would see them. The arrangements are discussed and compared with E's arrangement. Make corrections where necessary and discuss reasons for change. Reinforce understanding that where you sit makes a difference as to how you see things.

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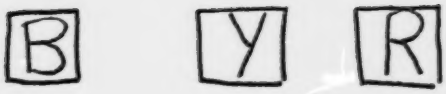
2. 

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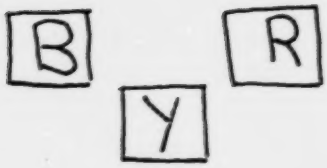
4. 

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E.

APPENDIX B

Procedures for Instruction In Social Studies Tasks

Procedures for Instruction in Social Studies Tasks

Week One

(1) Mostly About Me:

Materials: Prepared booklet with shape of a girl or boy. Two blank sheets inside.

Procedure: E. encourages Ss to talk about themselves ... appearance, likes ... How can we share this information with our friends? - tell them, make pictures ....

Have Ss prepare booklet "About Me." The front cover is coloured to represent child as seen from front. The back cover is coloured to represent child as seen from the back. For each blank page the child is to select something about himself that he wishes others to know about. During the preparation of the booklets E. directs Ss's observations - What colour is your hair? your eyes? ...

(2) More About Me - Feelings:

Materials: Book to read to children.
Outline of shape of head. Sticks for pasting "heads" on.
Helena the Unhappy Hippopotamus - Yutaka Sugita

Procedures: E. reads story - encourages Ss to talk about feelings.
I feel happy when .....
I feel unhappy when .....

Things that make me happy .....
Things that make me unhappy .....

I can make my mother happy by .....
I can make my teacher happy by .....
I can make myself happy by ..... etc.

Have Ss make a "Happy Face" for themselves and a "Sad Face." For each "face," the Ss is to tell a sentence or two to other members of the group.

(3) My Family:

Materials: Book - Papa Small - Lois Lenski

Week One (continued)

Procedure:
- Read story - discuss characters - working together, playing together, helping each other.
- Talk about own families - some families are the same - some families are different - some families are big - some families are small ....
- Have Ss make family portrait - mounted on construction paper - print names of family on portrait - picture to be taken home and hung on wall.

Week Two

(4a) Helpers: We Help Each Other

Materials: - Plain construction paper
- Crayons

Procedure: - Discussion - people in school who "help" pupils
- teacher, nurse, custodian, etc.
- how do pupils help the teacher, nurse, etc.
- Fold construction paper in quarters.
- Have Ss illustrate people helping one another. Have Ss dictate sentence to accompany picture. Encourage use of name of different individuals.

(4b) We Help Each Other (continued)

Materials: - Chart paper, individual papers
- Crayons

Procedure: - Recall names of people discussed in last session.
- As Ss dictate, list name of individuals on chart paper.
- Discuss "something" that Ss might do that would be helpful to someone in their class area. What does being helpful mean? Share ideas.
- List ideas on chart paper.
- Co-operative read shared ideas.

Week Three

(5) My School - I Like My School

Materials: - Prepared booklet in shape of simple building. Two blank sheets inside.

Procedures: - Recall "helping stories" from last session.
- Discuss things I like about my school. Encourage Ss to verbally elaborate reason for liking school. Briefly record in point form on chart paper list of things Ss like about their school.
- Read cooperatively. Have Ss give two aspects to illustrate in booklet. If time, have Ss dictate a sentence to accompany illustration.

(6) Inside My School - This is the way to ...

Materials: - Two sets of prepared cards. Each set contains 3 sets of "clues."
- Prelocate "clues" so that they are "found" in course of sessions.
- Drawing paper - crayons.

Procedures: - Introduce idea of clues - detective solving mystery by following a set of clues.
- Read first set of clues. Have Ss interpret and demonstrate understanding of clues by following instructions.
- Repeat for second and third set of clues.

Clues In Our School

Clue #1.

1. Stand in the library doorway. Face the wall in the hall.
2. Turn right. Walk along the hallway. Go past one door on the right hand side.
3. Stop at the double doors. Do not turn right. Do not turn left. Walk straight ahead.
4. Look at the umbrellas on the right.
5. Stop beside the opening in the wall on the right hand side. What is on the other side of this open window?
   Draw me.

Week Three (continued)

Clue #2.

1. Face the office. Turn left. Walk outside through the outside doors. Remember to use the door on the left.
2. Walk 5 big steps outside the door. Turn left. Walk 10 steps. In front and to the left is a pole. What is it?
   Draw me.

Clue #3.

1. Stand with your back to the flag pole. Face the street. Turn left.
2. Walk along the cement beside the classrooms.
3. Walk past four blue doors on the left. Count them.
4. Stop when you get to the fifth blue door. What is behind the door?
   Draw me.

Week Four

(7) People In My School
- A friend is ....
- I am a friend to ...

Materials: - Chart paper
- Drawing paper and crayons

Procedures:
- Discuss understanding of concept of "friend" - having a friend - being a friend.
- Under heading - "being a friend means" record Ss' ideas in point form.
- Divide drawing paper in two parts.
- Have subjects illustrate
  i) a friend is ...
  ii) I am a friend to ...
- Have subjects dictate a completion to each introductory phrase.

(8) People In My School - Interview

Materials: - Individual slips of blank paper
- Chart paper, marking pens

Procedures:
- Review names of personnel in school who interact with Ss.
- List names on chart paper.
- Identify one individual that is to be interviewed - (Prearrange with individual - selection will depend on availability) by the Ss.
- Discuss what Ss might wish to find out from the interviewee.
- Have each Ss dictate a question; E. records question on individual paper for Ss.
- Rehearse the asking of the question.
- Meet with interviewee. Each Ss is responsible for the asking of one question and the remembering of the answer.
- Return to meeting area. Weite story about interviewee on chart paper. Read story cooperatively.
- Have Ss give "story" to interviewee.

Week Five

(9) My Playground - Prediction and Verification

Materials: - Chart paper
- Marking pens

Procedures: - Discuss features of the school playground. Have Ss predict what they expect to find on playground.

- List predictions on chart paper.

- Visit playground. Take chart paper predictions. Have Ss locate and mark the predictions that do exist.

- Return to meeting area. Note changes that are required on prediction list.

- If time, prepare 2 new lists:
  (1) What we thought we would find on the playground.
  (2) What we did find on the playground.

(10) My Favorite Place on the Playground

Materials: - Drawing paper
- Crayons

Procedures: - Weather permitting, meet on grassy area in playground.

- Determine favorite areas. Have Ss make a drawing about their areas.

- Put pictures together to make mini-mural of playground.

Week Six

(11) My Home - This is where I live.

Materials: - Drawing paper
- Crayons

Procedures: - Discuss idea of homes ... What is a home? ... Different people have different types of homes ... some live in houses, some live in apartments ...

- Have Ss illustrate their homes. Encourage the use of detail - outside facade, street number, etc.

- Have Ss dictate a sentence to be printed on their pictures.

(12) My School Neighbourhood.

Procedures: - Weather permitting, plan a walk around block containing school property.

- Note landmarks of interest, street signs, shapes found in the local environment, activities of people, etc.

- Encourage Ss to ask questions, and share ideas with each other.

APPENDIX C

Attitude Measure

Administering Attitude Measure

The testing time is divided into two sections of about 10 minutes each. In the first session use stories #1 to #16. In the second session use stories #17 to #32.

1. Welcome Ss to testing area. Have Ss sit on chair beside E. so that each are looking at photographs from a similar position.

2. Say, "Hi ... My name is _____. I have some pictures of people that I would like to show to you. And I am going to tell you stories that go with the pictures. When I finish the story, I want you to point to the picture that the story is about. Okay?" (Make sure that the instructions are understood.)

   "Now, let's look at the pictures."

3. Number 1: "Here are two girls." Display card with picture of white girl and black girl. Tell story #1.

4. Once Ss have indicated a choice of a picture, ask Ss why they have selected that one. Record response in writing.

5. Continue procedures 3 and 4 with remaining stories.

Attitude Story Sequence

A. First Half	A. Second Half
1. Good girl	17. Good boy
2. Mean man	18. Mean woman
3. Stupid woman	19. Stupid man
4. Clean boy	20. Clean girl
5. Smart girl	21. Smart boy
6. Dirty man	22. Dirty woman
7. Kind woman	23. Kind man
8. Bad boy	24. Bad girl
9. Clean woman	25. Clean man
10. Stupid boy	26. Stupid girl
11. Dirty girl	27. Dirty boy
12. Smart man	28. Smart woman
13. Bad woman	29. Bad man
14. Kind boy	30. Kind girl
15. Mean girl	31. Mean boy
16. Good man	32. Good woman

Score - Black - 1
White - 2

Stories

Part I

#1. Good - girl
Two girls are in the same class at school.
One of them is good in school.
Which one is good?

#2. Mean - man
Two men had children in their family.
One of them was mean to the children in the family. Which one was mean?

#3. Stupid - woman
Two women work at the same job.
One of them is very stupid in her job.
Which one is stupid?

#4. Clean - boy
Two boys played in the mud. One of them stayed clean. Which one stayed clean?

#5. Smart - girl
Two girls are in the same class at school. One of them is smart in school. Which one is smart?

#6. Dirty - man
Two men went to work. One of them got dirty at work. Which one got dirty?

#7. Kind - woman
Two women had children in their family. One of them was kind to the children in the family. Which one was kind?

#8. Bad - boy
Two boys are in the same class at school. One of them is bad in school. Which one is bad?

#9. Clean - woman
Two women went to work. One of them got dirty at work. Which one stayed clean?

#10. Stupid - boy
Two boys are in the same class at school. One of them is stupid in school. Which one is stupid?

#11. Dirty - girl
Two girls played in the mud. One of them got dirty.
Which one got dirty?

Stories (continued)

#12. Smart - man
Two men work at the same job. One of them is very smart at work. Which one is smart?

#13. Bad - woman
Two women work at the same job. One of them is bad at her job. Which one is bad?

#14. Kind - boy
Two boys owned a dog. One of them was kind to the dog. Which one was kind?

#15. Mean - girl
Two girls owned a dog. One of them was mean to the dog. Which one was mean?

#16. Good - man
Two men work at the same job. One of them is good at his job. Which one is good?

Part II

#17. Good - boy
Two boys are in the same class at school. One of them is good in school. Which one is good?

#18. Mean - woman
Two women had children in their family. One of them was mean to the children in the family. Which one was mean?

#19. Stupid - man
Two men work at the same job. One of them is very stupid in his job. Which one is stupid?

#20. Clean - girl
Two girls played in the mud. One of them stayed clean. Which one stayed clean?

#21. Smart - boy
Two boys are in the same class at school. One of them is smart in school. Which one is smart?

#22. Dirty - woman
Two women went to work. One of them got dirty at work. Which one got dirty?

#23. Kind - man
Two men had children in their family. One of them was kind to the children in the family. Which one was kind?

Stories (continued)

#24. Bad - girl
Two girls are in the same class at school. One of them is bad in school. Which one is bad?

#25. Clean - man
Two men went to work. One of them got dirty at work. Which one stayed clean?

#26. Stupid - girl
Two girls are in the same class at school. One of them is stupid in school. Which one is stupid?

#27. Dirty - boy
Two boys played in the mud. One of them got dirty. Which one got dirty?

#28. Smart - woman
Two women work at the same job. One of them is very smart at work. Which one is smart?

#29. Bad - man
Two men work at the same job. One of them is bad at his job. Which one is bad?

#30. Kind - girl
Two girls owned a dog. One was kind to the dog. Which one was kind?

#31. Mean - boy
Two boys owned a dog. One of them was mean to the dog. Which one was mean?

#32. Good - woman
Two women work at the same job. One of them is good at her job. Which one is good?

APPENDIX D

Description of Piagetian Test Tasks

Administering Piagetian Test Tasks

The testing time is divided into two sections of about 12 minutes each. In the first session work with Tasks I, II and III. In the second session work with Tasks IV, V and VI.

The scoring range is from 1 to 4. One represents an inability to respond to the task. Four represents success with the total task. Scores of 2 and 3 represent success with succeeding steps within the task.

Piagetian Tasks - Part I

Task I - Two Dimensional Space

Materials: Cards with prepared models to be copied
Drawing paper
Pencils
Stir-sticks

Procedures:

1. Begin by asking each child to draw a person from memory - put child at ease.

2. Ask each child to copy the following set of models. Present each model individually in sequence outlined:

3. Child may be given stir-sticks to construct straight-sided models - number of stir-sticks given is not to correspond to number of sides.

4. Scoring
   - 4 - all
   - 3 - all except #12
   - 2 - all except #8 to #14
   - 1 - all or some of 1-6

Piagetian Tasks

Task II - Conservation of Number

Materials: 10 small red and 10 small yellow wooden blocks (2 cm. on a side).

Procedures: E. starts by lining up 4 red blocks opposite 4 yellow blocks in 1-1 correspondence. E. asks, "Are there as many blocks in my row as in your row?" (If the child says "No," the child is asked to make the rows equal). The E. then adds 2 blocks to just one of the rows. "Do I still have just as many blocks in my row as you have in yours?" (The researcher now makes the rows equal again by adding 2 blocks to the shorter row). The same question is repeated, "Do you have just as many blocks in your row of blocks as I have in my row of blocks." This procedure is continued until there are 10 blocks in both rows. The researcher then says, "Now watch what I am going to do." E. pushes the yellow row together and leaves the red row spread out. "Are there still as many yellow blocks in this row as there are red blocks in this row? Or are there more or less yellow blocks now that they have been pushed together? Why do you think that?"

Scoring

4 - task completion
3 - gives appropriate reason
2 - responds with the "same"
1 - non-conserver

Piagetian Tasks

Task III - Conservation of Distance

Materials: 2 toy dogs
2 toy cows
wooden blocks

Procedure: 1. E. places 2 items (dogs) on flat surface 8 inches apart. S is asked whether the dogs are "far apart" or "near together" to designate preference for identifying distance.
E. places a block between the two dogs. S is asked, "Now are they far apart or near together? Why do you think that?" [A child who conserves distance will assert that the distance remains the same whether the space is filled or empty, nonconservers make a variety of responses - the most common being that the distance is less because the block uses up some of the space between the dogs.]

2. Repeat using two toy pigs. Instead of single block, use 4 blocks to build a wall highers than cows.

3. Scoring:
4 - task completion
3 - completes part 2 (no reason)
2 - completes part 1
1 - non-conserver

Piagetian Tasks - Part II

Task IV - Composition of Classes

Materials: 8 wooden beads - 6 blue, 2 yellow
10 plastic buttons - 7 white, 3 black

Procedures:

1. E. displays beads for S. Have each S. handle the beads. E. establishes with S. the colours of the beads. E. asks, "Are there more blue than yellow beads?" E. records response and corrects if necessary to be certain that S. sees that there are more blue. E. establishes with S. that the beads are made of wood. The blue beads are wooden beads and the yellow beads are wooden beads. E. asks, "Are there more wooden beads or are there more blue beads? Why do you think that?"

2. Repeat the same procedure using the plastic buttons. Establish the colours and material. "Are there more black buttons than white buttons? Are there more plastic buttons than white buttons? Why do you think that?"

3. Scoring:
   - 4 - task completion
   - 3 - completes part 2 (no reason)
   - 2 - completes part 1
   - 1 - unable to respond to task

Piagetian Tasks - Part II (continued)

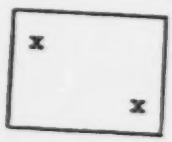
Task V - Straight Line Perspective

Materials: cardboard square (36 cm. sq.)(14 in. sq.) to serve as working surface for S.
plasticine
coloured stir sticks
coloured toothpicks

Procedures: 1. The cardboard square is placed on the table to provide a working surface for the S. Two coloured stir sticks on plasticine bases are also placed on the table. E. says, "Let us pretend that these are telephone poles. I am going to place one telephone pole here and the other telephone pole here. (E. places poles on the cardboard square so that end posts are about 3 in from the top and bottom side, are along the lefthand edge and are about 8 in. (20 cm.) apart.

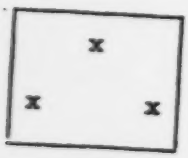
E. says, "Can you make a straight line between 2 poles with the toothpicks by putting the toothpicks flat on the table. E. notes child's performance (straight line, curved, zig-zag, randomly placed).

2. Repeat with diagonal on square.



Place "telephone poles" about 8 in. (20 cm.) apart.

3. E. then presents 3 "telephone poles" arranged in a triangle shape about 8 in. (20 cm.) apart. "Now there are 3 poles. "Can you make a straight line that joins this pole (E. indicates pole) to this pole, and then one that joins this pole to this pole?"



E. records response and draws configuration produced by S.

Piagetian Tasks - Part II (continued)

Task V

4. Scoring:
   - 4 - total task completion
   - 3 - completes part 2
   - 2 - completes part 1
   - 1 - unable to respond to task

Task VI - Co-ordination of Perspective

Materials: 3 models of mountains for display
- one - large, grey, snow at the top
- one - brown, blue stream running down the side, red cross on top
- one - smallest - green - little house at the top - white path leading to house

3 similar models of mountains for Ss manipulation
2 cardboard squares - about 14 in. (26 cm.) square

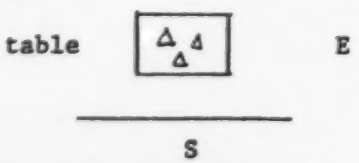
Procedures:

1. E. presents the 3 mountain model on a square cardboard base. The models are identified as mountains. "These pointed things are mountains. From different sides you can see different things on the mountains. This mountain is gray; it is large and has snow at the top. This mountain is brown, has a blue stream running down it and a red cross on the top. This is a green mountain. It has a little house on the top and a white path leading to the house. E. ensures that each S. sees the descriptions of the mountains. E. may ask questions to check understanding.

2. E. presents S with the three similar models and a cardboard base to provide a working surface. E. ensures that S can establish the relationships between the mountains; i.e., "Your gray mountain is just like this gray mountain", etc.

3. E. says, "I want you to arrange your mountains so that they are the way you see my mountains (indicate model in centre of table). E. records response.

4. E. moves so that E. is sitting at side of table 90° to S.



Piagetian Tasks - Part II (continued)

Task VI (continued)

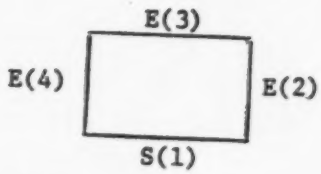
4. E. says, "Now I want you to arrange your mountains so that you see what I see. E. records response.

5. Repeat a) E. sits across the table from S.

   b) E. sits at other end of table 90°

All responses are recorded.

Sequence



6. Scoring:
   - 4 - total task completion
   - 3 - completes #5(a)
   - 2 - completes #4
   - 1 - unable to respond to task #3

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